



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,015	08/18/2003	Todd S. Emrick	7163	2962

22922 7590 10/12/2005

REINHART BOERNER VAN DEUREN S.C.  
ATTN: LINDA GABRIEL, DOCKET COORDINATOR  
1000 NORTH WATER STREET  
SUITE 2100  
MILWAUKEE, WI 53202

EXAMINER

FEELY, MICHAEL J

ART UNIT

PAPER NUMBER

1712

DATE MAILED: 10/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/643,015

Applicant(s)

EMRICK ET AL.

Examiner

Michael J. Feely

Art Unit

1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14, 15, 18 and 20-23 is/are rejected.
- 7) ☒ Claim(s) 13, 16, 17, 19 and 24-26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Pending Claims*

Claims 1-26 are pending.

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. The rejection of claims 1-5 under 35 U.S.C. 112, first paragraph, stands for the reasons of record: the specification, while being enabling for:

*A composite comprising a metallic nanoparticulate substrate component and a polymeric ligand component, wherein said ligand component comprises a nitrogenous coupling moiety between the substrate and the polymeric component,*

does not reasonably provide enablement for:

*A composite comprising a metallic nanoparticulate substrate component and a polymeric ligand component, wherein said ligand component comprises a nitrogenous coupling moiety and said polymeric component is between the substrate and the coupling moiety.*

The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

The scope of the instant claim language includes the following structures:

(1) [metallic nano-substrate] – [nitrogenous coupling moiety] – [polymeric ligand component]; and

(2) [metallic nano-substrate] – [polymeric ligand component] – [nitrogenous coupling moiety];

however, the Specification only supports embodiment (1) – *see page 6, lines 12-24 and Figures 1, 2 & 4.*

3. The rejection of claims 6-10 under 35 U.S.C. 112, first paragraph, stands for the reasons of record: the specification, while being enabling for:

Art Unit: 1712

*An emissive nanoparticle composite comprising a CdSe nanoparticle and an ethylene glycol ligand component, said component having a nitrogenous terminus selected from pyridinyl and aminopyridinyl moieties and said nitrogenous terminus is between the nanoparticle and the ethylene glycol ligand,*

does not reasonably provide enablement for:

*An emissive nanoparticle composite comprising a CdSe nanoparticle and an ethylene glycol ligand component, said component having a nitrogenous terminus selected from pyridinyl and aminopyridinyl moieties and said ethylene glycol ligand is between the nanoparticle and the nitrogenous terminus.*

The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

The scope of the instant claim language includes the following structures:

- (1) [nano-particle] – [nitrogenous terminus] – [ethylene glycol ligand]; and
- (2) [nano-particle] – [ethylene glycol ligand] – [nitrogenous terminus];

however, the Specification only supports embodiment (1) – *see page 6, lines 12-24 and Figures 1, 2 & 4.*

4. The rejection of claims 14, 15, and 18 under 35 U.S.C. 112, first paragraph, stands for the reasons of record: the specification, while being enabling for:

*A system including a second ligand component having a nitrogenous terminus/coupling moiety,*

does not reasonably provide enablement for:

*A system including a second ligand component without a nitrogenous terminus/coupling moiety.*

The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

The nitrogenous terminus/coupling moiety is an essential feature of the second ligand component. The Specification fails to describe an operable system using a second ligand component absent of the nitrogenous terminus/coupling moiety.

Art Unit: 1712

5. The rejection of claims 20-23 under 35 U.S.C. 112, first paragraph, stands for the reasons of record: the specification, while being enabling for:

*A method featuring a second ligand component having a nitrogenous terminus/coupling moiety,*  
does not reasonably provide enablement for:

*A method featuring a second ligand component without a nitrogenous terminus/coupling moiety.*

The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. The nitrogenous terminus/coupling moiety is an essential feature of the second ligand component. The Specification fails to describe an operable method using a second ligand component absent of the nitrogenous terminus/coupling moiety.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002

Art Unit: 1712

do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7. The rejection of claims 1-5, 11, and 12 under 35 U.S.C. 102(a) as being anticipated by Billancia et al. (*see entry A7 on IDS dated 2/7/05*) stands for the reasons of record.

Regarding claims 1-5, Billancia et al. disclose: *(1)* a composite comprising a metallic nanoparticulate substrate component (p.508: introduction) and a polymeric ligand component (p. 508: introduction), said ligand component comprising a nitrogenous coupling moiety (p. 508: introduction);

*(2)* wherein the substrate comprises a nanoparticle selected from CdSe, CdS, CdTe, ZnS, ZnSe, Co and combination thereof (p. 508: introduction);

*(3)* wherein said nitrogenous moiety is selected from amino, pyridinyl and aminopyridinyl moieties (p. 508: introduction);

*(4)* wherein said polymeric ligand component is selected from poly(ethylene glycol), poly(hexaethylene glycol), poly(hexadecylethylene glycol), poly( $\epsilon$ -caprolactone), poly(lactide), poly(glycolide), polyglycidyl, polypropylene oxide and combinations thereof (p. 508: introduction); and

*(5)* wherein said polymeric component comprises poly(ethylene glycol), said component with a terminus comprising a functional group moiety selected from hydroxyl, alkyl, alkoxy, carboxylate, thymine, ammonium salt and substituted ammonium salt moieties (p. 508: introduction).

Art Unit: 1712

Regarding claims 11 and 12, Billancia et al. disclose: *(11)* a polymeric ligand component comprising a poly(ethylene glycol) component (p. 508: introduction) and a first terminus comprising a pyridinyl moiety (p. 508: introduction), said poly(ethylene glycol) component comprising at least 2 ethylene glycol monomers and a second terminus comprising a functional group moiety selected from hydroxy, alkyl, alkoxy, carboxylate, thymine, ammonium salt and substituted ammonium salt moieties (p. 508: introduction); and *(12)* comprising up to about 100 ethylene glycol monomers (p. 508: introduction).

8. The rejection of claims 11 and 12 under 35 U.S.C. 102(e) as being anticipated by Ekwuribe et al. (US Pat. No. 6,380,405) stands for the reasons of record.

Regarding claims 11 and 12, Ekwuribe et al. disclose: *(11)* a polymeric ligand component comprising a poly(ethylene glycol) component (column 17, lines 1-44) and a first terminus comprising a pyridinyl moiety (column 17, lines 1-44), said poly(ethylene glycol) component comprising at least 2 ethylene glycol monomers and a second terminus comprising a functional group moiety selected from hydroxy, alkyl, alkoxy, carboxylate, thymine, ammonium salt and substituted ammonium salt moieties (column 17, lines 1-44); and *(12)* comprising up to about 100 ethylene glycol monomers (column 17, lines 1-44).

9. The rejection of claims 1 and 3 under 35 U.S.C. 102(e) as being anticipated by Gaw et al. (Pub. No.: US 2003/0124194 A1) stands for the reasons of record.

Regarding claims 1 and 3, Gaw et al. disclose: *(1)* a composite comprising a metallic nanoparticulate substrate component (paragraphs 0036, 0046, 0047; Figure 1) and a polymeric ligand component (paragraphs 0036, 0046, 0047; Figure 1), said ligand component comprising a

Art Unit: 1712

nitrogenous coupling moiety (paragraphs 0036, 0046, 0047; Figure 1); and (3) wherein said nitrogenous moiety is selected from amino, pyridinyl and aminopyridinyl moieties (paragraphs 0036, 0046, 0047; Figure 1).

### ***Allowable Subject Matter***

Claims 13, 16, 17, 19, and 24-26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Response to Arguments***

10. Applicant's arguments filed August 1, 2005 have been fully considered but they are not persuasive.

(1) Argument regarding 112 1<sup>st</sup> paragraph rejections – see page 6 of the response.

Applicants argue, “Applicant’s use of the term *coupling* is reasonably supported throughout the specification as describing a nitrogenous terminus/moiety between, *i.e.*, coupling a substrate and a polymeric component.”

The Examiner agrees that this embodiment is supported; however, the scope of the claims remains open to other possibilities that the specification does not support. The use of the word *coupling* does not mandate or specifically imply that the nitrogenous moiety is positioned between the nanoparticulate substrate and the polymeric ligand, coupling the polymeric ligand to the nanoparticulate substrate. It could also be terminally positioned with the polymeric ligand being attached directly to the nanoparticulate substrate or via another coupling moiety. This



Art Unit: 1712

terminal position yields a nitrogenous moiety that is capable of *coupling* so some other moiety; hence, the nitrogenous moiety is still considered a *coupling* moiety in this terminal position.

(2) Argument regarding 102(a) rejection over Billancia – see pages 6 and 7 of the response.

- *Terpyridine is not pyridine or pyridinyl.*

It should be first noted that this only applies to claims 3, 11, and 12, not claims 1, 2, 4, and 5.

Regarding claim 3, the scope of the claim is: “said ligand component comprising a nitrogenous coupling moiety, wherein said nitrogenous moiety is selected from amino, pyridinyl, and aminopyridinyl moieties.” In other words, it has to have a moiety selected from amino, pyridinyl, and aminopyridinyl; however, it is open other coupling moieties, including other nitrogenous moieties not conforming to the specifics of claim 3. In light of this, a portion of the terpyridinyl moiety can be considered a nitrogenous coupling moiety conforming to the specifics of claim 3, while the remainder of the terpyridinyl moiety can be considered some other nitrogenous coupling moiety encompassed by the open claim language.

Regarding claim 11 and 12 the scope of the claim is: “a polymeric ligand component comprising a poly(ethylene glycol) component and a first terminus comprising a pyridinyl moiety.” The first terminus *comprises* a pyridinyl moiety; hence, it can include other moieties. The terpyridinyl terminal of Billancia meets the criteria because it *comprises* a pyridinyl moiety.

- *The prior art is neither peer-reviewed nor conclusive.*

This may be the case; however, it still constitutes prior art.

Art Unit: 1712

- *Without further unspecified processing, Billancia does not place nitrogenous coordination (i.e., coupling) in public possession.*

This may be the case; however, the scope of the claims is open to an embodiment with a terminal (not coupled to the substrate) nitrogenous moiety that is capable of *coupling* to some other moiety.

(3) Argument regarding 102(e) rejection over Ekwuribe – see page 7 of the response.

Applicants argue, “Ekwuribe describes a number of polyethylene glycol pyridinium derivatives. Such pyridinium moieties are structurally different from Applicant’s pyridinyl moieties and, as would be understood by those skilled in the art, impart an entirely different chemical function to any associated polymeric component.” This may be the case; however, the structure of the prior art falls within the broad scope of claims 11 and 12 because the claim language does not appear to exclude *pyridinium derivatives* from the claimed *pyridinyl moiety*.

(4) Argument regarding 102(e) rejection over Gaw – see page 7 of the response.

Applicants argue, “the terminal, non-coupling amine/amide moieties of Gaw do not anticipate the present invention.” The Examiner respectfully disagrees because the scope of the claims is open to an embodiment with a terminal (not coupled to the substrate) nitrogenous moiety that is capable of *coupling* to some other moiety.

***Conclusion***

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

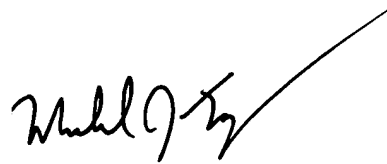
Art Unit: 1712

*Communication*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Feely whose telephone number is 571-272-1086. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Michael J. Feely', with a long, sweeping horizontal line extending to the right.

Michael J. Feely  
Primary Examiner  
Art Unit 1712

October 7, 2005